Keeping Edinburgh MOVING

A Strategy for Public Transport 2020 - 2035

December 2019

Keeping Edinburgh *MOVING*

The City is Slowing Down

Edinburgh is suffering from worsening traffic congestion which delays buses and hinders efforts to curb the growth in car use. Unlike many other large UK cities which have well-developed suburban rail services, Edinburgh's public transport is provided mostly by buses using the same roads as general traffic, resulting in low average speeds. **A top priority** for the city over the next few years **must be to accelerate public transport journeys**.

119.2 million passenger journeys were made on Lothian Buses in 2018, a decrease from 121.1 million in 2017, which the company's directors attributed to slower journeys because of congestion and changes in travel patterns. These figures compare with the 212.3 million journeys made in the year to May 1962, despite competition from Scottish Omnibuses – highlighting the fact that city bus usage has almost halved over 55 years, while the population has grown from 464,000 to 518,000 people.

The council's recently-approved **City Centre Transformation Strategy seeks to achieve a step-change in the quality of the environment of Edinburgh City Centre** with a range of schemes to be pursued over the next ten years. **Successful delivery of many aspects of the strategy will depend on a substantial reduction in the levels of traffic movement within the city centre**. The strategy assumes a 25% reduction in vehicle movement, but is not linked to any wider programme of action to achieve significant modal shift from private car to public transport across the city.

In the responses to the council's 'Connecting our City, Transforming our Places' public consultation exercise in autumn 2018, there was strong public support (87%) for expansion of the city's public transport system, including the tram network. However, **currently there are no proposals for any expansion of public transport** beyond reinstatement of the previously-cancelled tram line from York Place to Newhaven (originally due for opening in 2009 but now expected to open in 2023).

Furthermore there has been no detailed analysis of future city-wide travel demands and the implications of those demands for likely road traffic growth, nor any analysis of options for public transport investment designed to cater more sustainably for future travel demand and reverse the growth in car use.

Cars Are Quicker Than Buses

The majority of journeys between different parts of the city can be completed significantly faster by private car than by bus. So long as this situation prevails, road traffic flows will continue to increase and bus services will be further delayed by worsening congestion. This in turn will frustrate and undermine the aims of the City Centre Transformation Strategy.

The City Centre Transformation Strategy envisages starting to examine options for a possible second city tram route in 2025. By that date, implementation of other elements of the CCTS strategy will already be underway, potentially constraining options for tram routes and bus network enhancements within the central area. The potential operational efficiency of the tram extension to Newhaven has been compromised by works to Leith Walk which have been undertaken since the line construction was cut back to York Place in 2010, preventing the provision of a dedicated traffic-free tram alignment between Picardy Place and the Foot of the Walk. The imposition of similar constraints elsewhere in the city must be avoided until after completion of a city-wide assessment of the range of public transport improvements likely to be required over the next 25 years to cater for long-term growth in travel demand.

Start Planning Now For Tram Extensions

This assessment of public transport improvements must include examination of potential tram routes across the whole city, and the scope for Sheffield-style tram trains to operate on both existing Network Rail lines and future tram lines, particularly with a view to expanding that part of the public transport network which runs off-road and is therefore immune to road congestion.

An essential aspect of the resultant strategy must be to significantly reduce public transport journey times into and across the city compared with those which are currently achieved, coupled with wide-ranging traffic management measures, so as to achieve journey times by public transport which are comparable with or faster than by private car over as many routes as possible. **In view of the length of time which the delivery of any tram extensions will take, pre-planning action must start now**.

Tram Extension Potential - The Essential Principles

The natural advantage of modern rail-based mass-transit systems is their potential for carrying large volumes of passengers at relatively – for urban areas – high speeds. These advantages are maximised when the adopted route is either entirely off-road, like a conventional railway, or else follows a dedicated reserved alignment which is not used by general traffic – for example a central reservation or tram-only lane alongside general traffic. Both methods of ensuring that trams are not delayed by other traffic can be found on the existing Edinburgh tram line – for example between Haymarket and the airport (off-road) and on York Place (central reservation). Unfortunately most of the extension to Newhaven will follow a route shared with general traffic and therefore will be prone to delays and slow speeds.

In Manchester, much of the extensive tram network utilises former 'heavy rail' routes which are entirely separate from road traffic, and on these sections trams can run at speeds of up to 80 kph / 50 mph, much faster than on local roads. The section of Edinburgh's proposed tram network between Roseburn and West Granton Road, as approved by the Scottish Parliament in 2006, follows the alignment of a former railway line and thus would benefit from higher speed running.

In Nottingham city centre, trams run on streets which are mostly clear of other traffic and therefore are able to move swiftly through the centre. Faster speeds not only mean faster journeys for passengers than by other modes, but also mean that the distance per day which a tram can cover is increased, thus allowing more intensive utilisation of the available fleet. This in turn generates a better business case for implementing the investment.

A Nottingham tram running on a traffic-free street

By contrast, trams which are required to share the same road space as general traffic are inevitably subject to delays, which undermines their benefits and prevents their full potential being realised.

Consequently, in considering alternative routes for extensions to the tram network in Edinburgh, priority should be given to those routes along which the tram will experience the least delays and/or achieve the highest potential speeds.

A tram being held up by traffic on Princes Street

Crossing the City Centre

Any expansion of the tram network will necessitate evaluation of various options for connecting new routes to the existing line running through the city centre, ensuring that connections are feasible from an engineering viewpoint. Selection of the most suitable routes must observe the priorities already highlighted as regards maximising tram speeds and minimising conflict with other traffic, facilitating swift journeys for passengers across the city centre.

Delays to buses within the city centre are the primary cause of unduly lengthy and unattractive journeys between – for example – Portobello and Corstorphine, or Leith and Morningside. Consequently a high proportion of intending travellers will opt to use a car for these journeys if they have one available. **Accelerating journeys by public transport through the city centre will be an essential prerequisite to achieving modal shift away from the private car.**

Potential City Centre Tram Routes in the CCTS

Two purely notional routes for tram extensions through the city centre are shown on various diagrams in the City Centre Transformation Strategy (CCTS). One is a line continuing east along Princes Street from the existing tram line as far as the Balmoral Hotel, where it then turns right and heads southwards down The Bridges. A second route leaves the existing tram line at Haymarket and heads eastwards along Morrison Street and Lauriston Place, then follows the Potterow curve to Nicolson Square where it cuts through the join the Bridges route at Nicolson Street.

Both these routes raise major problems. **The Bridges corridor** is identified in the CCTS as a priority for improvements for cyclists and enhancement of public realm, but also as a major bus enhancement corridor and a primary north-south route for general traffic. These aims alone appear to be mutually exclusive and laden with potential conflicts. Superimposition of a tram line in addition to these other aims would result in undue conflicts between users and major delays to the tram. It is not a practical proposition. From a technical point of view it is highly unlikely that any form of junction design compatible with other traffic needs could be generated which could allow trams to make the tight turn from North Bridge onto Princes Street – a turn which buses struggle to perform now.

The section of **Morrison Street** east of Haymarket is a three-lane one way route westbound. Accommodating the tram in both directions here would be highly challenging, as would finding alternative routes for westbound traffic. The tram route from here eastwards would inevitably be compromised and very slow-running, running on narrow streets shared with other traffic east of Lothian Road.

Consequently both these routes score badly against the key criteria identified for minimising journey times across the city centre, as well as posing engineering difficulties. **Better routes should be identified**.

Towards a City-Wide Network

Before taking an analysis of potential city centre routes a stage further, it is appropriate to examine practical and desirable options for tram extensions which would establish a network of routes across the city to maximise access for residents to a fast, high quality public transport service.

Diagram A (inside back cover) **shows a potential city-wide tram network which seeks to utilise the fastest available alignments to serve as much of the city as possible, consistent with the design principles already outlined**. It also shows potential routes across the city centre which are described later.

Also included is a possible tram-train alignment using part of the former South Suburban line through Morningside. Tram-trains are now operational between Sheffield and Rotherham, using the existing tram line from Sheffield City Centre to Meadowhall before switching to 'heavy rail' freight and passenger railway tracks to and through Rotherham. The scheme has not been without major challenges, but has demonstrated that engineering, signalling and operational solutions can be found to allow light rail vehicles to operate on heavy rail lines. The Sheffield project is now being viewed as highly successful, and Transport for Wales is currently planning similar tram-train routes in Cardiff as part of a comprehensive upgrade and expansion of that city's suburban rail system.

West Edinburgh

West Edinburgh is already served by the existing tram line running between Haymarket and the airport via Murrayfield Stadium and Edinburgh Park. The alignment as far as Edinburgh Park Station follows the main Edinburgh – Glasgow railway line, allowing speeds of up to 70 kph / 45 mph to be achieved. The route passes fairly close to major concentrations of population but does not run through the heart of any residential areas. It is heavily used by commuters to and from Edinburgh Park business park, shoppers using the Gyle Shopping Centre, and airport travellers.

The disused route of the former Corstorphine branch railway diverges from the tram line adjacent to Balgreen tram stop. It survives as a footpath running along the eastern edge of Carrick Knowe golf course to the former Pinkhill Station, and then continues westwards alongside Pinkhill until it reaches The Paddockholme, the housing estate constructed on the former Corstorphine Station site. **The alignment of the former railway provides an opportunity for an off-road tram route** from Balgreen as far as Pinkhill, where it could then join the main A8 Corstorphine Road – which is mostly a four-lane road heading west through Corstorphine to the start of the city by-pass at Gogar roundabout.

The road through Corstorphine is heavily trafficked and would not be an ideal tram route without significant traffic management measures being implemented between Clermiston Road and Drum Brae. However the A90 and A71 roads provide alternative trunk routes into the city from the west, and **tram and general traffic could be readily accommodated between Drum Brae and Maybury, with the tram on a dedicated central reservation**.

This tram route would penetrate into the centre of a densely populated area of west Edinburgh, restoring faster rail-based access by public transport to Corstorphine (the branch railway was popular and well-used until closure at the end of 1967). At its western end, past Maybury, the line would reconnect with the existing tram line at Edinburgh Gateway, just east of Gogar Roundabout.

It is recommended that a full assessment be undertaken of the feasibility of taking a tram line from Balgreen to Maybury and Edinburgh Gateway via St John's Road.

Edinburgh Gateway Station

West Edinburgh is already served by three railway stations – South Gyle and Edinburgh Gateway on the Fife line, and Edinburgh Park on the Glasgow line. All have a good level of service, and Edinburgh Gateway and Edinburgh Park provide interchange with the tram. Edinburgh Park alone dealt with nearly 900,000 passengers in 2017-18, while the other two stations served a combined total of over 700,000 passengers. These figures demonstrate the potential of well-located suburban stations to provide sustainable journey opportunities and fast journeys – the journey time from Edinburgh Park to Edinburgh Waverley is only 9 minutes. **Greater use of these three stations as part of the city's public transport strategy should be encouraged.**

North West Edinburgh

Before the Barnton branch railway closed in 1951, the railway offered fast journey times into the city centre – 17 minutes from Barnton, 13 minutes from Davidson's Mains and 9 minutes from Craigleith. These journey times cannot be matched by today's bus services nor – during peak periods – by the private car.

The former Barnton branch railway

Parliamentary powers are still in place to construct that part of the originally planned tram network between Roseburn and Craigleith, which is entirely off-road and follows the track bed of the railway which formerly ran to Barnton and Leith North. After passing beneath the A90 road at Craigleith, the former railway route to Barnton diverges from the Leith North line and heads north-westwards. Today it forms a wide tract of grass occupied only by a footpath / cycleway extending as far as Ferry Road, east of Davidson's Mains.

T**his former railway route would provide a 3-mile off-road tram route** which would leave the existing tram line at the already-formed junction between Haymarket and Murrayfield and run north-westwards to Ferry Road - with stops at **Roseburn, Ravelston, Craigleith, Drylaw** (Telford Road) **and Davidson's Mains**. From here, the tram could continue along the wide and lightly-trafficked Silverknowes Road as far as the roundabout at the west end of **Silverknowes Parkway**, where an **inter-change with the existing bus terminus** would be available.

The tram line would divert from the former railway at Silverknowes Road East (above), with a tram stop here for Davidson's Mains, and continue down Silverknowes Road (below) to the existing bus terminus

A large proportion of the population of north-west Edinburgh would be within a 10-minute walk-in catchment of one of the stops along this route to Silverknowes, which would then provide a fast traffic-free journey into the city centre. This route should be promoted at the earliest opportunity.

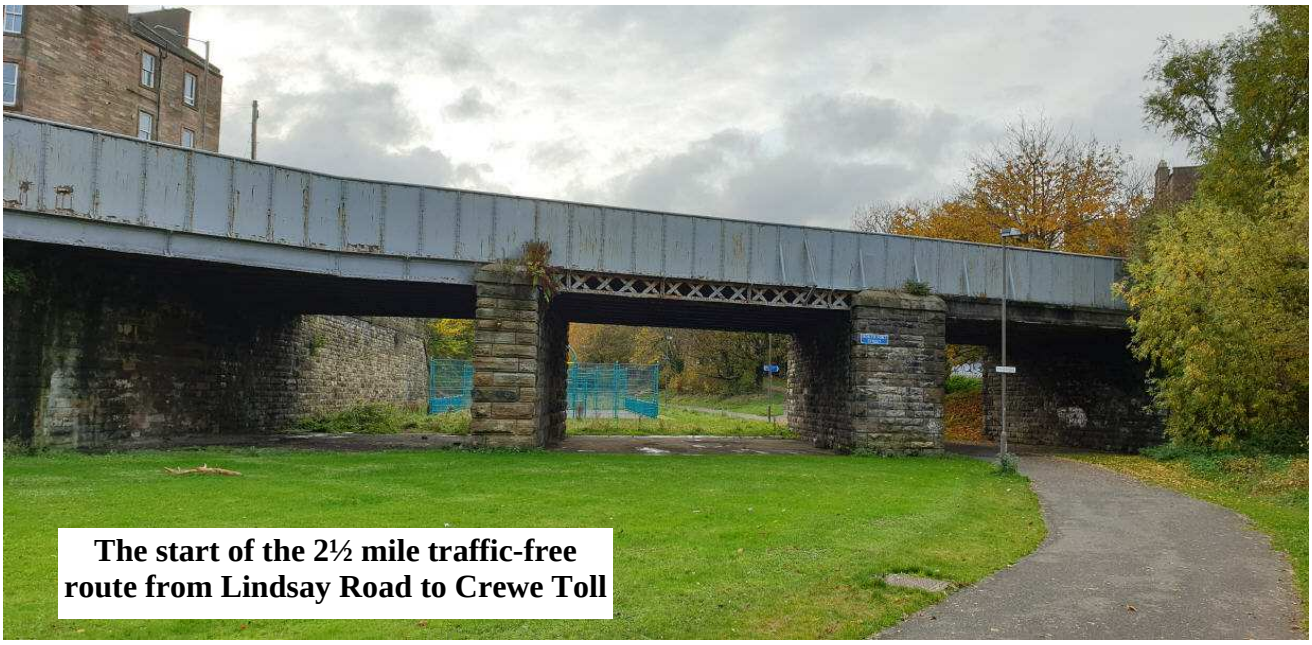
North Edinburgh

From Craigleith, the originally planned tram route ran on former railway to West Granton Road, and then on vacant land down to Granton Harbour, serving the new housing estates which mark the early stages of the unfinished Granton Waterfront development. The financial crisis of 2008 brought a halt to much of this regeneration initiative, and this section of the tram line was cancelled in 2009. From Granton Square the approved route follows the seaward side of Lower Granton Road, again on former railway alignment, before joining the seafront road past Starbank Park as far as the Asda store at Newhaven, where the tram line from York Place – due for completion in 2023 – will terminate.

Much of this route suffers from having only half a catchment area, the other half being the Firth of Forth. Between the east end of Lower Granton Road and Asda, the line would share a narrow busy road with general traffic, which would be far from ideal, particularly as congestion tends to build up at the Asda end of the route.

A potentially preferable alternative, which would penetrate far more effectively into the densest areas of population in north Edinburgh, would be for the tram to follow the former Leith North railway eastwards from Crewe Toll, through East Pilton and the Goldenacre area, **linking up with the approved Newhaven tram line** just east of its terminus at Lindsay Road.

The line runs parallel with Ferry Road, a slow and congested route which the tram line would help to relieve, **providing a fast link between Leith, Trinity, Granton, East Pilton, Crewe Toll and** the shopping facilities at **Craigleith**.



The start of the 2½ mile traffic-free route from Lindsay Road to Crewe Toll

This route would also provide a much faster link – entirely off-road – to the Gyle Centre, Edinburgh Park and the airport than will be possible using the tram route via the city centre. By using vacant land and former railway alignment, construction of the route could be achieved with much less cost and disruption than if following existing roads.

A cycle path has been laid along the route, but much of the alignment was originally a four-track railway, and is therefore more than adequate for both cycleway and tram. At the western end towards Crewe Toll the alignment is narrower, but the edge-to-edge width of the former railway land is still potentially wide enough for both tram and cycle path.

A full assessment of the benefits of the direct former railway route from Crewe Toll to Lindsay Road should be undertaken, and this route should be added to the potential tram expansion network.

East and South-East Edinburgh

Portobello

Diagram A does not show any new tram line eastwards to Portobello and Joppa – a route which carried traditional trams until the 1950s. The alignment along the A1 and A1140 roads from Leith Walk – where a new tram line would diverge – to Portobello is generally quite wide and could accommodate a tram route, and some sections of the route might offer scope for a central reservation to avoid traffic queues. However it does not suffer from the levels of congestion and slow running of buses which are experienced along other corridors where the tram could potentially offer much faster journeys than by bus.

Portobello Station was located on the East Coast Main Line, three miles east of Edinburgh Waverley, and was accessed from Brighton Place to the south of the town hall. Prior to 1962 it had an excellent train service, as frequent as that serving Haymarket, with 18 trains to Waverley during the 7 am to 9 am morning peak, and 20 trains back from the city between 4.05 pm and 6.58 pm. The non-stop journey to and from Waverley took only six minutes, far faster than any road-based journey today. However the station closed in 1964 when the train service to Musselburgh (the original town centre station) was withdrawn.

Despite persistent public campaigning over many years in support of the reopening of Portobello Station, the notion has been resisted because of the difficulties which would be created by stopping trains on the main line in the path of fast services to and from Berwick, Newcastle and points south (the original station was served by separate tracks which no longer exist). However it is recognised by Network Rail and Transport Scotland that major capacity enhancements will soon be needed to the existing railway on its approach into Edinburgh, which could include reinstating separate tracks for stopping services to allow for a new Portobello Station to be constructed.

Such an initiative could greatly improve accessibility into Edinburgh from the Portobello area, and the feasibility of such a scheme ought to be thoroughly assessed as part of the analysis into options for capacity enhancements to the railway from Berwick and Dunbar into Edinburgh. **Transport Scotland and Network Rail should be urged to include the reopening of Portobello Station as an option in their analyses of potential capacity improvements for the eastern approaches into Edinburgh Waverley.**

Options for the South Eastern Area

In almost all schemes for light rail and tram routes proposed for Edinburgh over the past thirty or more years, the main A7 – now A701 – road from Salisbury Place to Cameron Toll (Minto Street / Mayfield Gardens) has been identified as a main artery along which to take a route to serve south-eastern parts of Edinburgh. The road is four lanes wide and could readily accommodate tram lines, as it did prior to the mid-1950s, potentially including some tram-only sections.

Minto Street

Since the 1980s **Cameron Toll** has been a major destination because of its modern shopping centre, and it is also located at the convergence of three main roads from the south, all of which potentially could be used for tram routes. The three routes shown on Diagram A, all radiating from Cameron Toll, are:

1 **The A701 corridor southwards to Straiton** – for the retail park and Park and Ride – potentially offering scope for an **extension out to Penicuik**

2 **The A7 corridor to Edinburgh Royal Infirmary, Danderhall and Sheriffhall Park and Ride** (with the potential for an extension into Dalkeith town centre), together with a branch to the new community at **Shawfair**, with an interchange serving the new Borders Railway station

3 **The Craigmillar corridor through Niddrie to Fort Kinnaird retail park and Newcraighall**, possibly also extending to (1) **Queen Margaret University** with an interchange at **Musselburgh railway station**, and (2) **Musselburgh town centre** via Newhailes Road and Olive Bank Road (the former railway). This latter option would require careful design to ensure tram priority along the existing road between Newcraighall and Musselburgh

These three routes from Cameron Toll would broaden choice for park-and-ride opportunities and provide faster sustainable journeys by public transport for some of the most densely populated parts of suburban Edinburgh, as well as inter-linking with established rail services. A full feasibility assessment should be undertaken to establish all the potential benefits of expanding the tram network in this sector of the city.

South and South-West Edinburgh

The residential areas which extend along the A70 and A702 road corridors form an almost continuously built-up area between the City Centre and the City By-pass. They rely almost entirely on buses for local public transport, apart from those areas served by Slateford, Kingsknowe, Wester Hailes and Curriehill stations on the railway line to Glasgow Central via Shotts, which has recently been electrified.

The Rail Service

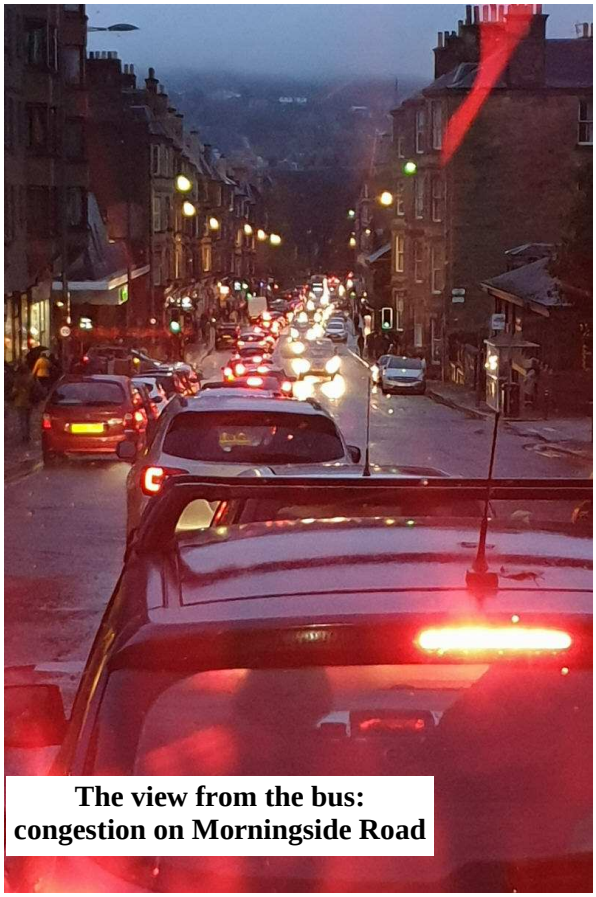
The rail service to these stations only operates hourly, other than some increase in frequency during the morning and evening peak period. The busiest of the four stations is Curriehill with 69,000 passengers per year, while the other three stations serve a combined passenger level of less than 100,000 journeys. These are low levels of usage compared with South Gyle's 433,000 journeys and Musselburgh's 488,000, despite each of the four stations offering swift travel times into Waverley (from Curriehill the journey time is around 20 minutes, and from Slateford 10 minutes).

It is possible that the current infrequent service is suppressing demand, but no increase in frequency above current levels can be achieved until the Curriehill electricity substation is upgraded. **It is to be hoped that the modern electric trains now operating, together with an increase in frequency in due course, will encourage greater usage of these suburban stations.**

The A70 Corridor

The A70 road broadly follows the railway route out of Edinburgh city centre as far as Slateford, and remains parallel to the railway to Currie and Balerno. As with most radial roads, it suffers from congestion throughout the day, more particularly between Haymarket and Slateford. The road becomes wider and faster beyond Slateford, but overall journey times by bus between the city centre and the outer suburbs are slow – from Currie, buses are timed to take around 45 minutes to Princes Street during the peak period.

Given the existence of the parallel railway it would be difficult to justify extending the tram down this corridor, and attempting to accommodate both tram and general traffic down Dalry Road and Ardmillan Terrace to Slateford Road would be very challenging. **Further bus priority measures would appear preferable, together with a more frequent rail service.**



The view from the bus: congestion on Morningside Road

The A702 Corridor

The A702 corridor through Morningside is heavily congested throughout the working day and on Saturdays. Until 1956, trams ran through Morningside and on to Fairmilehead, but the route now would not lend itself to modern tram operation, because of restricted road width through Bruntsfield and down Morningside Road. For the same reason there are few opportunities to provide bus priority lanes, and journey times from the city centre to and beyond Morningside are unduly lengthy. Consequently other options for improving public transport need to be examined.

The South Suburban Railway

There have been many attempts to make a case for reopening the South Suburban Railway to passengers. This route closed in September 1962 but remains open for freight traffic. Prior to 1962 the passenger service operated as a circle service from Waverley through Haymarket to Gorgie, Craiglockhart, Morningside, Blackford Hill, Newington, Duddingston and then through – but not stopping at – Niddrie, before joining the East Coast Main Line at Portobello to return into Waverley. A full circle journey took 35 to 40 minutes, and the journey time from Morningside to Waverley was 13 minutes, compared to today's peak hour bus journey of 25 minutes or more.

A ScotRail train on a diversion through Morningside, on the South Suburban Railway, in 2006

In addition to claims that there is no sound business case for a passenger service on the railway, two principal reasons have been cited against its reopening :

1 The line is used by freight trains, and Network Rail intends to electrify and intensify use of the line for this purpose;

2 The main line sections of the route, from Haymarket eastwards and Portobello westwards into Waverley, are at full capacity and could not accommodate a frequent service of suburban trains using the South Suburban line.

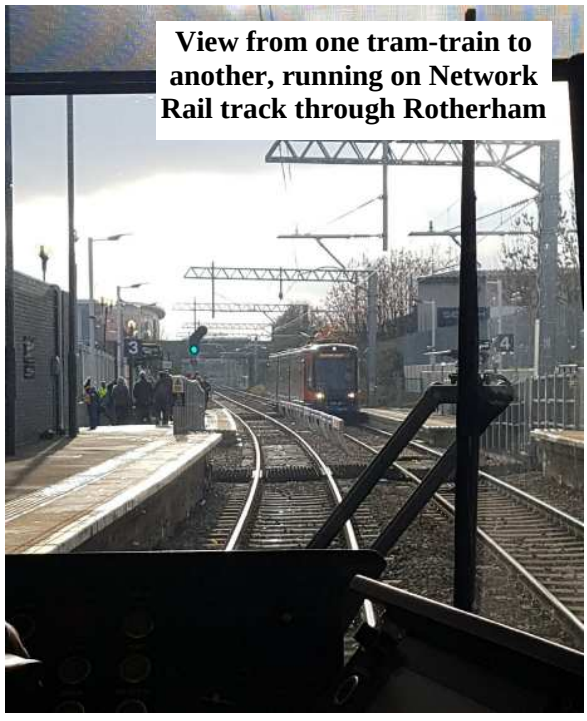
As an alternative, it has been suggested that tram trains – similar to those now operating between Sheffield and Rotherham and planned for Cardiff's suburban system – could be used to run on the South Suburban line, and could transfer to the existing tram line instead of using main-line railway tracks to reach the city centre. However no detailed feasibility analysis has been undertaken.

Network Rail and Transport Scotland hope to implement the electrification and upgrade of the South Suburban line in the fairly near future, and consequently a scheme to accommodate tram-trains would need to be devised as part of that project.

As the south-western sector of the city is probably the most challenging in terms of accommodating any tram line extensions, it is considered that the western section of the South Suburban line should be examined as a potential tram-train route, which would need to share the route with freight traffic. Having engineered the line to enable tram-trains to move swiftly from the city centre into the south-western part of the city, further consideration could then be given to planning a future tram line which would branch off the South Suburban and head further into the south-west sector of the city, perhaps to Oxgangs and Fairmilehead.

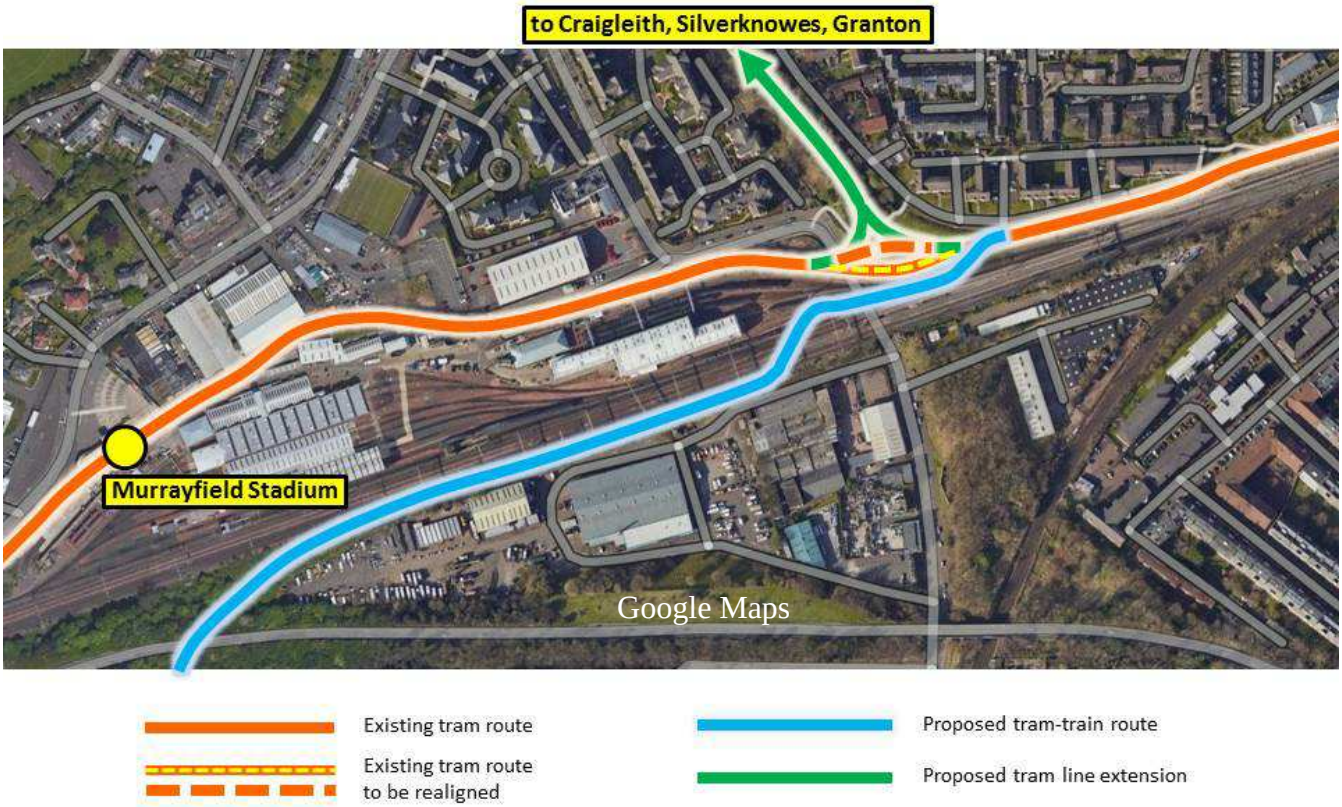
A new Sheffield tram-train

There has been considerable debate as to how the tram-trains would access the South Suburban line without having to occupy intensively-used Network Rail track at Haymarket. One possibility, shown on page 13, **Diagram B**, is for a link to be constructed between the existing tram track at Balbirnie Place – between Haymarket and Murrayfield Stadium tram stops – and the South Suburban line, involving a flyover which would cross the existing Network Rail tracks in the vicinity of Haymarket motive power depot. The tram line would then join the South Suburban alignment at Haymarket East Junction. While the flyover would be an expensive piece of infra-structure, it would mean that tram-trains would not have to occupy any existing passenger railway tracks.



View from one tram-train to another, running on Network Rail track through Rotherham

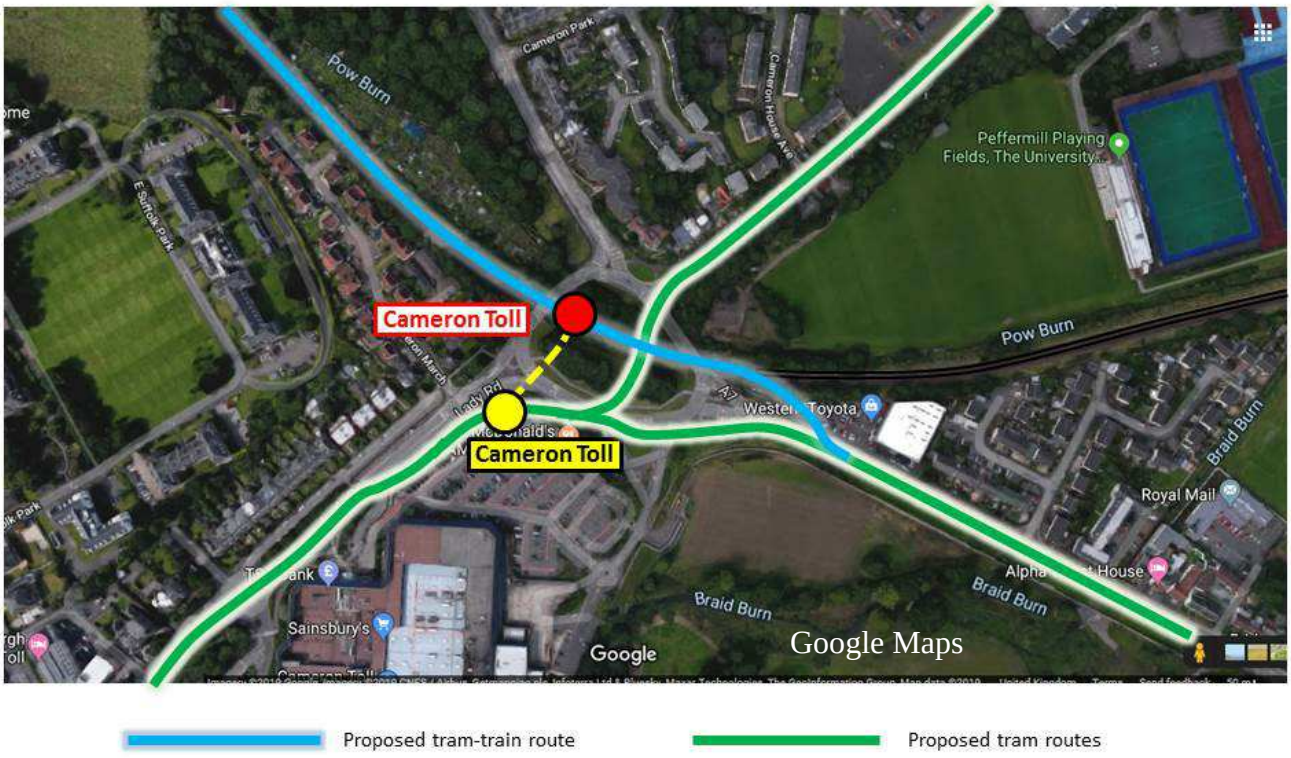
Diagram B: Tram-Train Link - possible alignment to connect to South Suburban line



Tram stops could be provided on the South Suburban line at Gorgie Road, Shandon, Craiglockhart, Morningside, Blackford Hill, Mayfield and Cameron Toll. Tram-trains would then leave the South Suburban at a new junction and descend onto the A7 road to connect with the new tram line to Sheriffhall (see Diagram C, page 14). One option would be for the tram-trains to run as far as the Royal Infirmary and terminate there, thus providing the ERI with an extra service linking it to other parts of the city.

The A7 road east of Cameron Toll - the tram-train link would descend onto the road from the railway

Diagram C : Tram-Train Link - South Suburban line to A7 road at Cameron Toll



Cameron Toll would therefore become a major new interchange between two tram lines and the South Suburban tram-train route. From here, passengers would be able to take trams into the city centre or tram-trains towards Haymarket, connecting with other tram services there. Mayfield (the former Newington Station) would also provide a second interchange between tram and tram-train.

Although Network Rail envisage the South Suburban line operating as a major freight route, the intensity of movement of freight traffic is unlikely to be such as to preclude a frequency of three or four tram-trains per hour in each direction on the 3¾ mile Gorgie to Cameron Toll section of the line. The remaining sections of the route would be used by freight traffic only.

In Cardiff, a city only two-thirds the size of Edinburgh, two extensive new tram-train routes are being proposed for a budget substantially less than it cost to provide 8½ miles of tram line in Edinburgh. The tram-train concept is likely to unlock many more suburban rail development opportunities in the years ahead. **Early examination of the tram-train options for Edinburgh should be initiated with Transport Scotland and Network Rail, with particular focus on the section of the South Suburban line described in this paper.**

City Centre Tram Routes

With a potential tram and tram-train network across the city identified, it is now appropriate to return to the issue of identifying the most suitable routes for additional tram lines **within** the city centre. It has already been concluded that the routes suggested in the City Centre Transformation Strategy – Morrison Street to Lauriston Place and Princes Street to The Bridges and Surgeon's Hall – have significant deficiencies as tram routes. Better alternatives should be found.

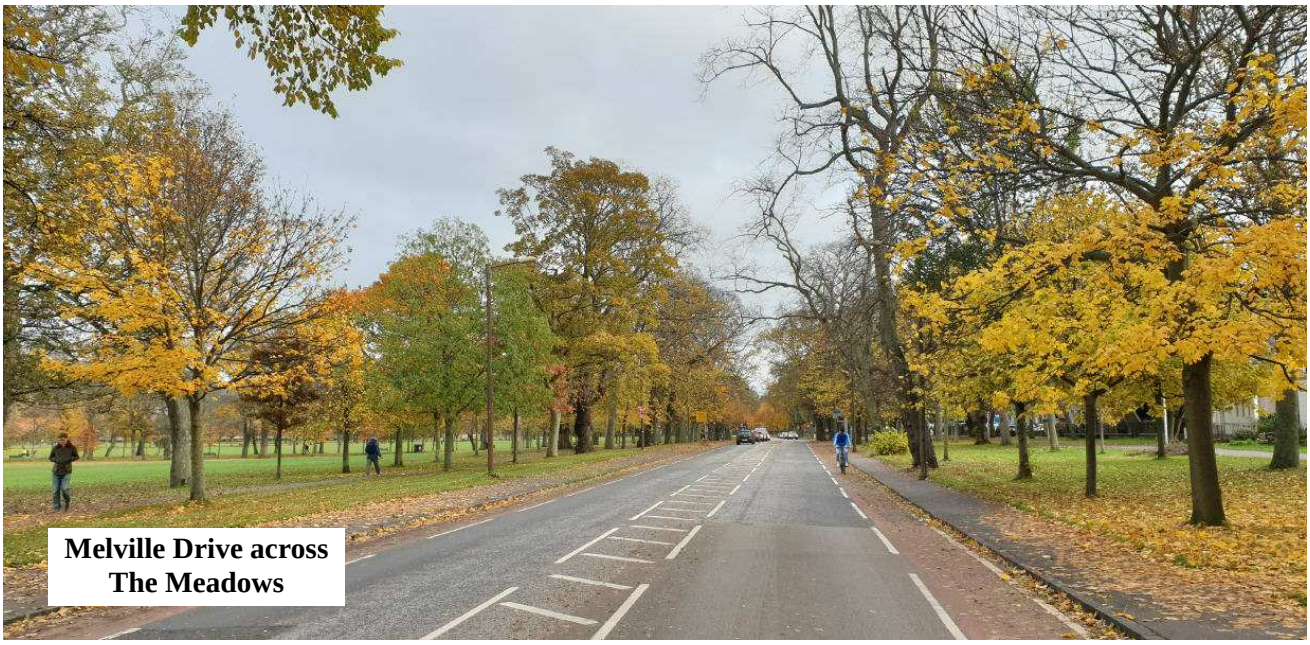
The new tram routes suggested to **Corstorphine**, **Silverknowes** and **Granton** can all be readily connected to the existing tram line at the junction which has already been part-formed between Haymarket and Murrayfield Stadium. However the routes from south Edinburgh which converge on Cameron Toll require a new link into the city centre.

Having converged at Cameron Toll, the appropriate route northwards – already discussed – is along Minto Street to Salisbury Place. However, given the many conflicting aspirations for The Bridges corridor set out in the CCTS, a tram route continuing northwards along Nicolson Street and The Bridges would be seriously compromised, and trams would be subject to potentially severe delays.

Lothian Road - Meadows

A preferable route between Salisbury Place and the existing city centre tram line would be via Meliville Drive across The Meadows and into Lothian Road, connecting with the existing line by the Caledonian Hotel. There is sufficient public highway land here to enable the tram from Lothian Road to turn either left or right onto Princes Street – although the first preference would be a right turn, so as to provide passengers from the south with a direct link to the Princes Street tram stop. This would also enable trams to run on a loop back to Cameron Toll via the second proposed city centre route (see page 16).

Melville Drive is relatively light-trafficked and would be much less likely to impose delays on the tram than The Bridges route. Tollcross Junction would require major remodelling, but both Earl Grey Street and Lothian Road are six-lane highways with more than adequate land to accommodate the tram, alongside and potentially separate from other traffic.



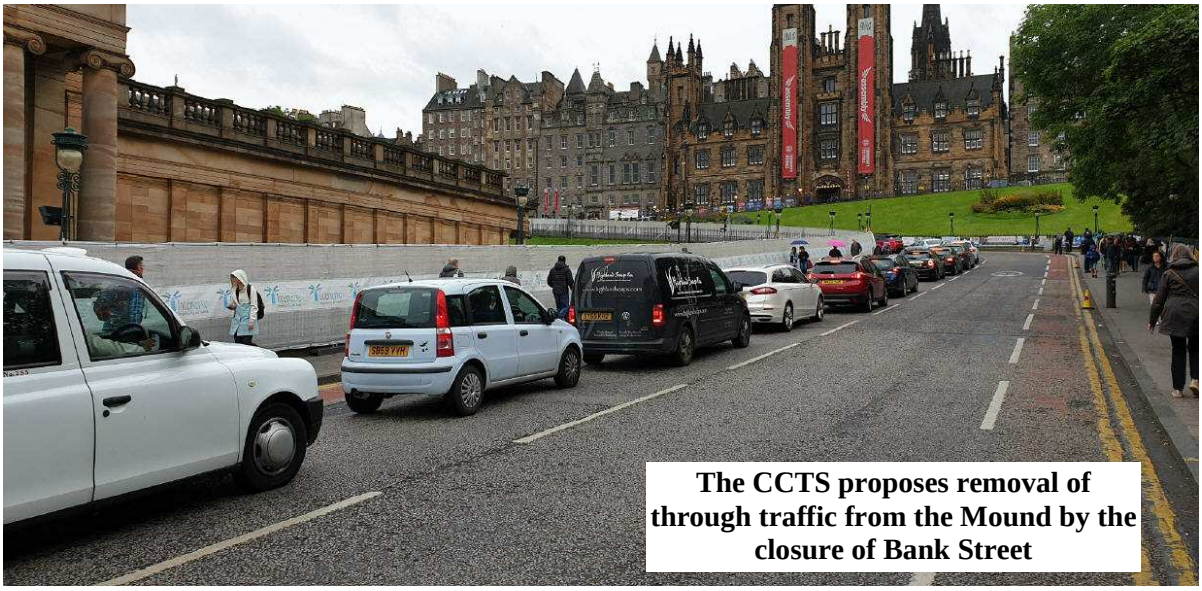
Melville Drive across The Meadows

The City Centre Transformation Strategy envisages enhancing Lothian Road with traffic-calming and public realm works to create a more pleasing boulevard environment. These proposals – if modestly modified – would be compatible with accommodating the tram and would help to ensure a smooth uninterrupted passage along this thoroughfare. **Lothian Road is eminently more suitable than The Bridges as a tram route, being a more important focus for commerce, tourism and leisure activities, with a significantly wider carriageway.**

George IV Bridge

The CCTS proposes removal of through traffic from George IV Bridge by closing Bank Street at the top of the Mound. This raises the possibility of constructing a second north-south tram line between Princes Street and the proposed Meadows route. This line would turn off Princes Street immediately to the east of the tram stop and run up the Mound and along George IV Bridge, then follow Bristo Place onto Potterow, continuing down Buccleuch Street to link with the Meadows route at the Melville Drive junction. General north-south through traffic would be routed via South Clerk Street, so as to give priority to the tram along Buccleuch Street.

A key advantage of the George IV Bridge route would be to provide tram access to the Old Town and Royal Mile, as well as serving the university area around the McEwan Hall. Although trams ran up the Mound and along George IV Bridge until 1956, it is possible that current design standards would require the tram line to be single track from Market Street southwards as far as George IV Bridge, to enable the tram to make the turn from North Bank Street into Bank Street. However this would not be a problem with modern signalling on a road free of general traffic.



The CCTS proposes removal of through traffic from the Mound by the closure of Bank Street

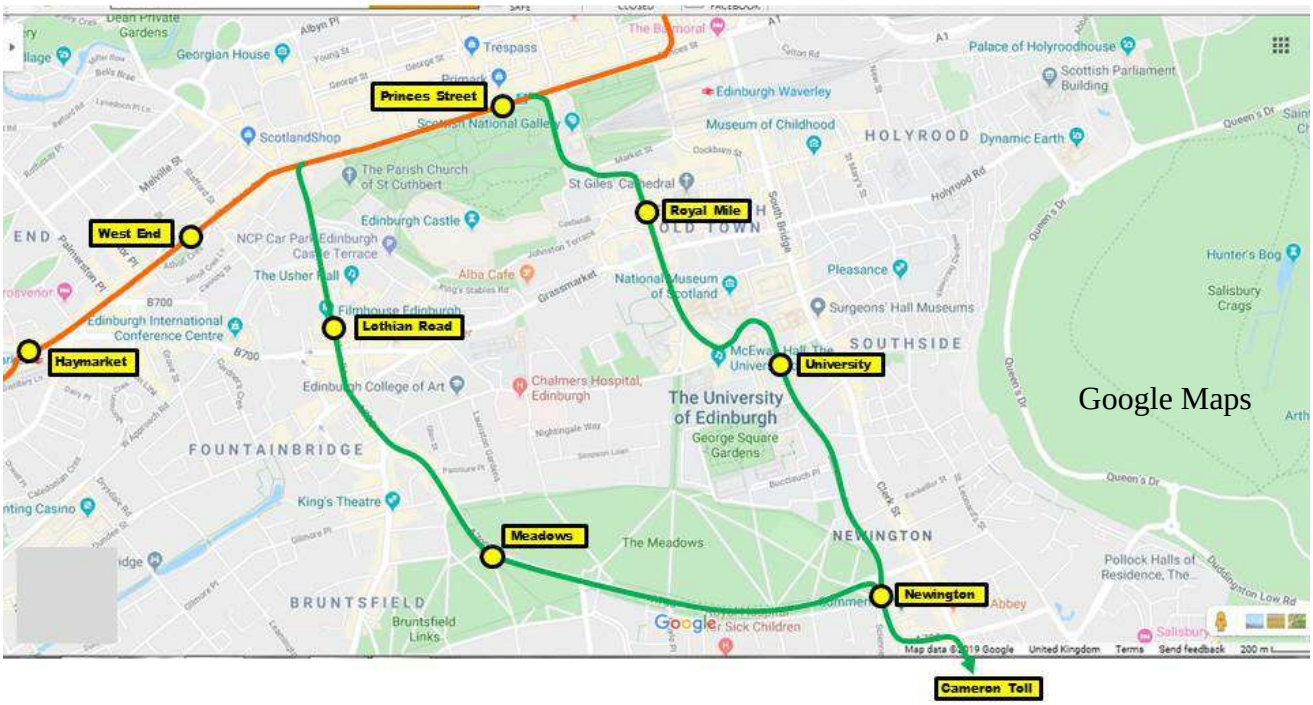
In view of the proposal to close Forrest Road to traffic, it would be necessary for all traffic and the tram to use the relatively narrow Bristo Place. Although this would be something of a 'pinch point', the volume of through traffic should be greatly reduced by the closure of Bank Street, and again modern signalling should enable this short stretch of road to function adequately for both tram and general traffic.

Diagram D on page 17 shows the two potential tram routes across the city centre, together with existing and proposed tram stops. As mentioned on page 15, trams from Cameron Toll could approach the city centre via The Meadows and return via George IV Bridge, or vice versa, thereby removing the need to terminate and reverse in the city centre. This would also allow passengers to travel direct between Lothian Road and George IV Bridge without changing trams.

Conclusions

The City of Edinburgh cannot wait until 2025 for planning of future tram extensions to begin. As a billion-plus pound investment, the tram system must be expanded swiftly to form the bedrock of the city's future public transport network. Furthermore the design of its expansion must be governed by the principle of achieving significant acceleration of journeys by public transport. **Perpetuation of the current situation – whereby journeys by private car in the city are almost always faster than by public transport – is not a sustainable option.**

Diagram D: Potential Tram Network Extensions – City Centre Routes



The potential network described in this paper seeks to adhere to the principle of delivering faster more sustainable travel for Edinburgh's residents, employees and visitors. **Work needs to start now to evaluate options and set down a realistic programme of implementation.** The proposals set out in this paper are compatible with and assist in promoting the principles of the CCTS, but ongoing work on elements of the CCTS should take full account of the need to expand the tram network, and to select routes which are the best ones available in order to speed up journeys by public transport.

The City of Edinburgh Council is urged to take action now to ensure that full advantage is taken of the huge investment in the tram, spreading the benefits to every part of the city, and building a public transport network which can become established as the first choice of travel mode for everyone who needs to move around the city.

Keeping Edinburgh *MOVING*